WHAT IS CLAIMED IS:

1. A ball bat configured for impacting a ball, the bat comprising:

a substantially tubular frame extending along a longitudinal axis having a handle portion and a primary hitting portion; and

a substantially tubular body coaxially aligned with the hitting portion of the frame, the body including a proximal end, a distal end, and first and second tubular wall transition regions, the first tubular wall transition region positioned closer to the proximal end than the second tubular wall transition region, the wall thickness of the first tubular wall transition region generally increasing along the longitudinal axis from a first position, generally near the proximal end, toward the distal end, and the wall thickness of the second tubular wall transition region generally increasing along the longitudinal axis from a second position, generally near the distal end, toward the proximal end, the body being configured to move independently with respect to the hitting portion of the frame upon impact with the ball.

2. The ball bat of claim 1, wherein the first and second tubular wall transition regions each have a length within the range of 0.25 to 7.0 inches.

3. The ball bat of claim 1, wherein the first and second tubular wall transition regions each have a length within the range of 0.50 to 5.0 inches.

4. The ball bat of claim 1, wherein the first and second tubular wall transition regions each have a length within the range of 2.0 to 4.0 inches.

5. The ball bat of claim 1, wherein the tubular body further includes an intermediate tubular region having generally uniform wall thickness and positioned between the first and second tubular wall transition regions.

6. The ball bat of claim 5, wherein the intermediate tubular region has a length within the range of 0.25 to 9.0 inches.

7. The ball bat of claim 5, wherein the intermediate tubular region has a length within the range of 0.1 to 5.0 inches.

8. The ball bat of claim 1, wherein the tubular body further includes a proximal tubular region and a distal tubular region, wherein the proximal tubular region is positioned adjacent the proximal end of the body, and wherein the distal tubular region is positioned adjacent the distal end of the body.

9. The ball bat of claim 8, wherein at least one of the proximal and distal tubular regions has a generally uniform wall thickness.

10. The ball bat of claim 1, wherein the difference in wall thickness from a first end of the first tubular wall transition region to a second end of the first tubular wall transition region is within the range of 0.003 to 0.040 inches, and the difference in wall thickness from a first end of the second tubular wall transition region to a second end of the second tubular wall transition region is within the range of 0.003 to 0.040 inches.

11. The ball bat of claim 10, the difference in wall thickness of the first tubular wall transition region is within the range of 0.005 to 0.015 inches, and wherein the difference in wall thickness of the second tubular wall transition region is within the range of 0.005 to 0.015 inches.

12. The ball bat of claim 10, the difference in wall thickness of at least one of the first and second tubular wall transition regions is within the range of 0.006 to 0.010 inches.

13. The ball bat of claim 1, wherein the wall thickness of the first tubular wall transition region generally increases linearly along the longitudinal axis from the first position, generally near the proximal end, toward the distal end.

14. The ball bat of claim 1, wherein the wall thickness of the second tubular wall transition region generally increases linearly along the longitudinal axis from the second position, generally near the distal end, toward the proximal end.

15. The ball bat of claim 1, wherein the wall thickness of the first tubular wall transition region generally increases non-linearly along the longitudinal axis from the first position, generally near the proximal end, toward the distal end.

16. The ball bat of claim 1, wherein the wall thickness of the second tubular wall transition region generally increases non-linearly along the longitudinal axis from the second position, generally near the distal end, toward the proximal end.

17. The ball bat of claim 1, wherein the wall thickness of the body is within the range of 0.025 to 0.090 inches.

18. The ball bat of claim 1, wherein the body is a one-piece unitary member.

19. The ball bat of claim 1, wherein the body is formed of two or more pieces, and wherein the two or more pieces are positioned in one of an end to end configuration, an overlapping configuration and a combination thereof.

20. The ball bat of claim 1, wherein the tubular body is positioned within the hitting portion of the tubular frame.

21. The ball bat of claim 20, wherein the body has inner and outer tubular surfaces, wherein the diameter of the inner tubular surface varies by at least 0.005

inches along its length, and wherein the diameter of the outer tubular surface is substantially uniform along its length.

22. The ball bat of claim 1, wherein the hitting portion of the tubular frame is positioned within the tubular body.

23. The ball bat of claim 22, wherein the body has inner and outer tubular surfaces, wherein the diameter of the inner tubular surface is substantially uniform along its length, and wherein the diameter of the outer tubular surface varies by at least 0.005 inches along its length.

24. The ball bat of claim 1, wherein the body further includes at least one longitudinally extending slit extending from the proximal end of the body toward the distal end of the body.

25. A ball bat configured for impacting a ball, the bat comprising:

a substantially tubular frame extending along a longitudinal axis having a handle portion and a primary hitting portion; and

a substantially tubular body coaxially aligned with the hitting portion of the frame, the body including a proximal end, a distal end, a central region, and a distal tubular wall transition region, the distal tubular wall transition region positioned near the distal end of the body, the wall thickness of the central region being generally uniform along the longitudinal axis, the wall thickness of the distal tubular wall transition region generally increasing along the longitudinal axis from a first position, generally near the distal end, toward the proximal end, the body being configured to move independently with respect to the hitting portion of the frame upon impact with the ball.

26. The ball bat of claim 25, wherein the body further includes a proximal tubular wall transition region at a position proximal of the central region, and wherein

the proximal wall transition region has a wall thickness that generally increases along the longitudinal axis from a second position, generally near the proximal end, toward the distal end.

27. The ball bat of claim 25, wherein the distal tubular wall transition region has a length within the range of 0.25 to 7.0 inches.

28. The ball bat of claim 25, wherein the distal tubular wall transition region has a length within the range of 0.50 to 5.0 inches.

29. The ball bat of claim 25, wherein the distal tubular wall transition region has a length within the range of 2.0 to 4.0 inches.

30. The ball bat of claim 25, wherein the generally uniform wall thickness of the central region varies by less than 0.003 inches along its length.

31. The ball bat of claim 25, wherein the central region has a length within the range of 0.25 to 9.0 inches.

32. The ball bat of claim 25, wherein the central region has a length within the range of 0.1 to 5.0 inches.

33. The ball bat of claim 25, wherein the tubular body further includes a proximal end tubular region and a distal end tubular region, wherein the proximal end tubular region is positioned adjacent the proximal end of the body, and wherein the distal end tubular region is positioned adjacent the distal end of the body.

34. The ball bat of claim 25, wherein the difference in wall thickness from a first end of the distal tubular wall transition region to a second end of the distal tubular wall transition region is within the range of 0.003 to 0.040 inches.

35. The ball bat of claim 34, the difference in wall thickness of the distal tubular wall transition region is within the range of 0.005 to 0.015 inches.

36. The ball bat of claim 34, the difference in wall thickness of the distal tubular wall transition regions is within the range of 0.006 to 0.010 inches.

37. The ball bat of claim 25, wherein the increase in wall thickness of the distal tubular wall transition region along the longitudinal axis from the first position generally near the distal end toward the proximal end, is linear, non-linear, stepped, staggered or a combination thereof.

38. The ball bat of claim 26, wherein the increase in wall thickness of the proximal tubular wall transition region along the longitudinal axis from the second position generally near the proximal end toward the distal end, is linear, non-linear, stepped, staggered or a combination thereof.

39. The ball bat of claim 25, wherein the wall thickness of the body is within the range of 0.025 to 0.090 inches.

40. The ball bat of claim 25, wherein the body is a one-piece unitary member.

41. The ball bat of claim 25, wherein the body is formed of two or more pieces, and wherein the two or more pieces are positioned in one of an end to end configuration, an overlapping configuration and a combination thereof.

42. The ball bat of claim 25, wherein the tubular body is positioned within the hitting portion of the tubular frame.

43. The ball bat of claim 42, wherein the body has inner and outer tubular surfaces, wherein the diameter of the inner tubular surface varies by at least 0.005

inches along its length, and wherein the diameter of the outer tubular surface is substantially uniform along its length.

44. The ball bat of claim 25, wherein the hitting portion of the tubular frame is positioned within the tubular body.

45. The ball bat of claim 44, wherein the body has inner and outer tubular surfaces, wherein the diameter of the inner tubular surface is substantially uniform along its length, and wherein the diameter of the outer tubular surface varies by at least 0.005 inches along its length.

46. The ball bat of claim 25, wherein the body further includes at least one longitudinally extending slit extending from the proximal end of the body toward the distal end of the body.

47. A ball bat performance-enhancing member, the ball bat having a substantially tubular frame extending along a longitudinal axis, and having a handle portion and a primary hitting portion, the bat being configured for impacting a ball, the performance-enhancing member comprising:

a substantially tubular body coaxially aligned with the hitting portion of the frame, the body including a proximal end, a distal end, and first and second tubular wall transition regions, the first tubular wall transition region positioned closer to the proximal end than the second tubular wall transition region, the wall thickness of the first tubular wall transition region generally increasing along the longitudinal axis from a first position, generally near the proximal end, toward the distal end, and the wall thickness of the second tubular wall transition region generally increasing along the longitudinal axis from a second position, generally near the distal end, toward the proximal end, the body being configured to move independently with respect to the hitting portion of the frame upon impact with the ball.

48. The ball bat performance-enhancing member of claim 47, wherein the first and second tubular wall transition regions each have a length within the range of 0.50 to 5.0 inches.

49. The ball bat performance-enhancing member of claim 47, wherein the first and second tubular wall transition regions each have a length within the range of 2.0 to 4.0 inches.

50. The ball bat performance-enhancing member of claim 47, wherein the tubular body further includes an intermediate tubular region having generally uniform wall thickness and positioned between the first and second tubular wall transition regions.

51. The ball bat performance-enhancing member of claim 50, wherein the intermediate tubular region has a length within the range of 0.1 to 5.0 inches.

52. The ball bat performance-enhancing member of claim 47, wherein the tubular body further includes a proximal tubular region and a distal tubular region, wherein the proximal tubular region is positioned adjacent the proximal end of the body, and wherein the distal tubular region is positioned adjacent the distal end of the body.

53. The ball bat performance-enhancing member of claim 47, wherein the difference in wall thickness from a first end of the first tubular wall transition region to a second end of the first tubular wall transition region is within the range of 0.003 to 0.015 inches, and the difference in wall thickness from a first end of the second tubular wall transition region to a second end of the second tubular wall transition region is within the range of 0.003 to 0.015 inches.

54. The ball bat performance-enhancing member of claim 47, wherein the increase in wall thickness of the first tubular wall transition region along the longitudinal axis from the first position generally near the proximal end toward the distal end, is linear, non-linear, stepped, staggered or a combination thereof.

55. The ball bat performance-enhancing member of claim 47, wherein the increase in wall thickness of the second tubular wall transition region along the longitudinal axis from the second position generally near the distal end toward the proximal end, is linear, non-linear, stepped, staggered or a combination thereof.

56. The ball bat performance-enhancing member of claim 47, wherein the body is a one-piece unitary member.

57. The ball bat performance-enhancing member of claim 47, wherein the body is formed of two or more pieces, and wherein the two or more pieces are positioned in one of an end to end configuration, an overlapping configuration and a combination thereof.

58. The ball bat performance-enhancing member of claim 47, wherein the tubular body is configured to be positioned within the hitting portion of the tubular frame.

59. The ball bat performance-enhancing member of claim 47, wherein the tubular body is configured to receive and surround at least a portion of the hitting portion of the tubular frame.

60. The ball bat performance-enhancing member of claim 47, wherein the body further includes at least one longitudinally extending slit extending from the proximal end of the body toward the distal end of the body.

61. A ball bat configured for impacting a ball, the bat comprising:

a substantially tubular frame extending along a longitudinal axis having a handle portion and a primary hitting portion; and

first and second substantially tubular inserts each coaxially aligned with the hitting portion of the frame, the first insert being positioned within the second insert, each of the first and second inserts including a proximal end, a distal end, and first and second tubular wall transition regions, each of the first tubular wall transition regions being positioned closer to the proximal end than each of the second tubular wall transition region, the wall thickness of each of the first tubular wall transition regions generally increasing along the longitudinal axis from a first position, generally near the proximal end, toward the distal end, and the wall thickness of each of the second tubular wall transition regions generally increasing along the longitudinal axis from a second position, generally near the distal end, toward the proximal end, each of the first and second inserts being configured to move independently with respect to the hitting portion of the frame and each other upon impact with the ball.

62. The ball bat of claim 61, wherein the first and second tubular wall transition regions of the first and second inserts each have a length within the range of 0.25 to 7.0 inches.

63. The ball bat of claim 61, wherein the at least one of the first and second inserts further includes an intermediate tubular region having generally uniform wall thickness and positioned between the first and second tubular wall transition regions.

64. The ball bat of claim 63, wherein the intermediate tubular region has a length within the range of 0.25 to 9.0 inches.

65. The ball bat of claim 61, wherein at least one of the first and second insert further includes a proximal tubular region and a distal tubular region, wherein the proximal tubular region is positioned adjacent the proximal end, and wherein the distal tubular region is positioned adjacent the distal end.

66. The ball bat of claim 61, wherein the difference in wall thickness from a first end of the first tubular wall transition region to a second end of the first tubular wall transition region of at least one of the first and second inserts is within the range of 0.003 to 0.040 inches, and the difference in wall thickness from a first end of the second tubular wall transition region to a second end of the second tubular wall transition region of at least one of the first and second inserts is within the range of 0.003 to 0.040 inches.

67. The ball bat of claim 66, the difference in wall thickness of the first tubular wall transition region is within the range of 0.005 to 0.015 inches, and wherein the difference in wall thickness of the second tubular wall transition region is within the range of 0.005 to 0.015 inches.

68. The ball bat of claim 61, wherein the wall thickness of the first tubular wall transition regions of at least one of the first and second inserts generally increases linearly along the longitudinal axis from the first position, generally near the proximal end, toward the distal end.

69. The ball bat of claim 61, wherein the wall thickness of the second tubular wall transition region of at least one of the first and second inserts generally increases linearly along the longitudinal axis from the second position, generally near the distal end, toward the proximal end.

70. The ball bat of claim 61, wherein the wall thickness of the first tubular wall transition region of at least one of the first and second inserts generally increases non-linearly along the longitudinal axis from the first position, generally near the proximal end, toward the distal end.

71. The ball bat of claim 61, wherein the wall thickness of the second tubular wall transition region of at least one of the first and second inserts generally

increases non-linearly along the longitudinal axis from the second position, generally near the distal end, toward the proximal end.

72. The ball bat of claim 61, wherein each of the first and second inserts has inner and outer tubular surfaces, wherein the diameter of the inner tubular surface of at least one of the first and second inserts varies by at least 0.003 inches along its length, and wherein the diameter of the outer tubular surface of at least one of the first and second inserts is substantially uniform along its length.

73. A ball bat configured for impacting a ball, the bat comprising:

a substantially tubular frame extending along a longitudinal axis having handle portion and a primary hitting portion, the hitting portion including a distal region, a proximal region, first and second frame wall transition regions, the first frame wall transition region positioned closer to the proximal end than the second frame wall transition region, the wall thickness of the first frame wall transition region generally increasing along the longitudinal axis from a first position, generally near the proximal region of the hitting portion, toward the distal region of the hitting portion, and the wall thickness of the second frame wall transition region generally increasing along the longitudinal axis from a second position, generally near the distal region of the hitting portion, toward the proximal region of the hitting portion; and

a substantially tubular body coaxially aligned with the hitting portion of the frame, the body including a proximal end, a distal end, and first and second tubular wall transition regions, the first tubular wall transition region positioned closer to the proximal end than the second tubular wall transition region, the wall thickness of the first tubular wall transition region generally increasing along the longitudinal axis from a first position, generally near the proximal end, toward the distal end, and the wall thickness of the second tubular wall transition region generally increasing along the longitudinal axis from a second position, generally near the distal end, toward the

proximal end, the body being configured to move independently with respect to the hitting portion of the frame upon impact with the ball.

74. The ball bat of claim 73, wherein the tubular body further includes an intermediate tubular region having generally uniform wall thickness and positioned between the first and second tubular wall transition regions.

75. The ball bat of claim 73, wherein the hitting portion further includes an intermediate frame region having generally uniform wall thickness and positioned between the first and second frame wall transition regions.

76. The ball bat of claim 73, wherein the difference in wall thickness from a first end of the first tubular wall transition region to a second end of the first tubular wall transition region is within the range of 0.003 to 0.040 inches, and the difference in wall thickness from a first end of the second tubular wall transition region to a second end of the second tubular wall transition region is within the range of 0.003 to 0.040 inches.

77. The ball bat of claim 76, the difference in wall thickness of the first tubular wall transition region is within the range of 0.005 to 0.015 inches, and wherein the difference in wall thickness of the second tubular wall transition region is within the range of 0.005 to 0.015 inches.

78. The ball bat of claim 73, wherein the difference in wall thickness from a first end of the first frame wall transition region to a second end of the first frame wall transition region is within the range of 0.003 to 0.040 inches, and the difference in wall thickness from a first end of the second frame wall transition region to a second end of the second frame wall transition region is within the range of 0.003 to 0.040 inches.

79. The ball bat of claim 78, the difference in wall thickness of the first frame wall transition region is within the range of 0.005 to 0.015 inches, and wherein the difference in wall thickness of the second frame wall transition region is within the range of 0.005 to 0.015 inches.

80. The ball bat of claim 73, wherein the body is a one-piece unitary member.

81. The ball bat of claim 73, wherein the body is formed of two or more pieces, and wherein the two or more pieces are positioned in one of an end to end configuration, an overlapping configuration and a combination thereof.

82. The ball bat of claim 73, wherein the tubular body is positioned within the hitting portion of the tubular frame.

83. The ball bat of claim 73, wherein the body has inner and outer tubular surfaces, wherein the diameter of the inner tubular surface varies by at least 0.003 inches along its length, and wherein the diameter of the outer tubular surface is substantially uniform along its length.

84. The ball bat of claim 73, wherein the hitting portion has inner and outer hitting portion surfaces, wherein the diameter of the inner hitting portion surface varies by at least 0.003 inches along its length, and wherein the diameter of the outer hitting portion surface is substantially uniform along its length.

85. A ball bat comprising:

a substantially tubular frame extending along a longitudinal axis having a handle portion and a primary hitting portion; and

a substantially tubular body coaxially aligned with the hitting portion of the frame, the body including a proximal end, a distal end and an average thickness

value from the proximal end to the distal end, the wall thickness of the body varying along its length such that at least first and second separate portions of the body each have thickness greater than the average thickness, and at least third and fourth separate portions of the body each have a wall thickness below the average wall thickness value, the body being configured to move independently with respect to the hitting portion of the frame upon impact with the ball.

86. The ball bat of claim 85, wherein one of the third and fourth separate portions is positioned between the first and second portions of the body.

87. The ball bat of claim 86, wherein each of the first, second, third and fourth portions have a length of at least one inch.

88. The ball bat of claim 85 wherein the differential in wall thickness of body between at least one of the first and second portions and at least one of the third and fourth portions is within the range of 0.003 to 0.040 inches.

89. The ball bat of claim 85 wherein the differential in wall thickness of body between at least one of the first and second portions and at least one of the third and fourth portions is within the range of 0.005 to 0.015 inches.